WHAT IS CLAIMED IS:

1. A hyperacuity printing system usable to render image data on a photosensitive recording medium, the image data being rendered as an array of pixels across the photosensitive recording medium in both a fastscan direction and an orthogonal slowscan direction, the hyperacuity printing system comprising:

an output scanning device having a writing device that writes scan spots on the photosensitive recording medium;

transformation circuitry that transforms grayscale input image data into grayscale output image data, and

a modulating device that receives the grayscale output image data from the transformation circuitry and that drives the output scanning device by intensity modulating scan spots in accordance with the grayscale output image data,

wherein the transformation circuitry includes:

a halftoner that renders toneart;

a thresholder that renders non-continuous tone data,

a resampling fabricator, coupled to the thresholder, that provides information about local rate of change of intensity of scan spots on the photosensitive recording medium in both fastscan and slowscan directions;

a segmenter that switches between the thresholder and the halftoner to provide grayscale output image data;

an encoder that discards image data corresponding to half of the pixels of the image data and compresses the remaining image data so that data corresponding to two non-continuous tone pixels are compressed into a single compressed-data-bitword; and

a data decompressor that decompresses a data in a single compressed-data-bitword to render the two pixels of non-continuous tone data and synthesizes data to render a third pixel of non-continuous tone data, the data decompressor being coupled to the thresholder.

2. The hyperacuity printing system of claim 1, wherein the encoder discards image data along a direction of an edge while keeping image data across the direction of the edge.

3. The hyperacuity printing system of claim 1, wherein the encoder maintains any image data indicative of continuous tone data so that each pixel of continuous tone data corresponds to a separate bitword.

4. The hyperacuity printing system of claim 1, wherein the encoder discards image data to produce low spatial resolution data corresponding to continuous tone data and high spatial resolution data corresponding to non-continuous tone data.

5. The hyperacuity printing system of claim 1, wherein the decompressor decompresses non-continuous tone data with a high spatial resolution in one dimension into a high spatial resolution bitword-map with reference to information indicating a direction of an edge within the image data.

6. The hyperacuity printing system of claim 1, wherein the decompressor processes continuous tone data with a low spatial resolution to provide a low spatial resolution bitword-map.

7. The hyperacuity printing system of claim 6, wherein the decompressor synthesizes bitwords of information corresponding to discarded non-continuous tone data.

8. The hyperacuity printing system of claim 1, wherein the encoder discards image data corresponding to non-continuous tone data in one direction of the image data contained in a high spatial resolution bitword-map.

9. The hyperacuity printing system of claim 8, wherein the encoder discards image data corresponding to non-continuous tone data so that resolution is maintained in a direction perpendicular to an edge and resolution is discarded in a direction parallel to the edge.

10. The hyperacuity printing system of claim 8, wherein the encoder discards image data to produce low spatial resolution data corresponding to continuous tone data and high spatial resolution data corresponding to non-continuous tone data.

11. The hyperacuity printing system of claim 1, wherein each of the bitwords are bytes.

12. The hyperacuity printing system of claim 11, wherein the encoder compresses data, indicative of a plurality of explicit pixels remaining after discarding image data, into a single bitword.

13. The hyperacuity printing system of claims 12, wherein the encoder:

converts a value indicative of a first pixel from a seven bit value to a three-bit value;

converts a value indicative of a second pixel from a seven bit value to a three-bit value;

establishes a direction bit indicating a direction of an edge located in spaced relationship to the first and second pixels; and

establishes a segmentation bit indicating that the bitword contains non-continuous tone data.

14. The hyperacuity printing system of claim 13, wherein the decompressor:

references the segmentation bit of the bitword to determine whether the bitword contains non-continuous tone data;

references the direction bit to determine whether the direction of the edge located in spaced relationship to the first and second pixels;

references the three-bit value indicative of the first pixel; and

references the three-bit value indicative of the second pixel.

15. The hyperacuity printing system of claim 13, wherein the direction bit indicates a direction of synthesis to be performed using the data contained in the decompressed-data-bitword.

16. The hyperacuity printing system of claim 15, wherein the decompressor synthesizes data in either a fastscan direction or a slowscan direction based on the direction bit.

17. The hyperacuity printing system of claim 16, wherein the direction bit defines sufficient information for the decompressor to determine which pixel positions are to be synthesized.

18. The hyperacuity printing system of claim 17, wherein the decompressor renders twice as many pixels in a direction perpendicular to an edge indicated by the direction bit.

19. The hyperacuity printing system of claim 17, wherein, when the direction bit indicates an edge that extends along the slowscan direction, the decompressor performs high frequency spatial resolution in the slowscan direction by using the three-bit value associated with the first pixel and the three-bit value associated with the second pixel in the compressed-data-bitword to determine slope in the fast scan direction to render the edge.

20. The hyperacuity printing system of claim 17, wherein, when the direction bit indicates an edge that extends along the fastscan direction, the

decompressor performs high frequency spatial resolution in the fastscan direction by using the three-bit value associated with the first pixel and the three-bit value associated with the second pixel in the byte of compressed data to determine slope in the slow scan direction to render the edge.

21. The hyperacuity printing system of claims 12, wherein the encoder comprises:

a first portion that converts a value indicative of a first pixel from a seven bit value to a three-bit value;

a second portion that converts a value indicative of a second pixel from a seven bit value to a three-bit value;

a third portion that establishes a direction bit indicating a direction of an edge located in spaced relationship to the first and second pixels; and

a fourth portion that establishes a segmentation bit indicating that the bitword contains non-continuous tone data.

22. The hyperacuity printing system of claim 13, wherein the decompressor comprises:

a first portion that references the segmentation bit of the bitword to determine whether the bitword contains non-continuous tone data;

a second portion that references the direction bit to determine whether the direction of the edge located in spaced relationship to the first and second pixels;

a third portion that references the three-bit value indicative of the first pixel; and

a fourth portion that references the three-bit value indicative of the second pixel.